



Brotherhood of Railroad Signalmen

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www.regulations.gov)

Docket Operations Facility
U. S. Department of Transportation
1200 New Jersey Avenue, SE, W12-140
Washington, DC 20590

Re: Docket No. FRA-2009-0037
Norfolk Southern — Notice of Application for Approval of Discontinuance or Modification
of a Railroad Signal System or relief From the Requirements of Title 49 CFR Part 236

Comments of the Brotherhood of Railroad Signalmen

The Brotherhood of Railroad Signalmen (BRS) is filing comments in opposition to the above-referenced waiver that was printed in the May 29, 2009, Federal Register (pages 25796–25797). The BRS is the duly recognized collective bargaining representative, under the Railway Labor Act, for 10,000 signal craft employees employed by various railroads in the United States, all of whom are directly or indirectly affected by this waiver request. For the reasons set forth below, the BRS submits that FRA should deny the Norfolk Southern Corporation (NS) waiver request.

NS requests a waiver pertaining to the use of a device for automated execution of certain Federal Railroad Administration (FRA) required tests made at signal interlockings and control points on the NS system. NS requests that FRA allow it to implement a system called InterTest® to perform numerous FRA-required tests that have in the past been performed manually by employees. Using the InterTest® system as a substitute for current methods of performing FRA-required tests adds a very complex dimension to this safety-critical process.

NS alleges that using the InterTest® system will enhance safety compared to the current manual methods of testing signal systems; however, that assertion has yet to be proven. As such, FRA should be very cautious with any proposed waiver that designs away human perceptions in FRA-required, safety-critical testing. NS alleges that the automated tester enhances safety because it removes the human factor in the monitoring and execution of test steps. BRS asserts that

removing human perceptions from the testing sequence may, in fact, be less safe because an automated testing device lacks critical decision making capability and may miss problems, errors, and omissions for which it is not designed or programmed to find.

The system that NS proposes installing across its system is a processor-based system that performs safety-critical testing. This system is connected directly to the signal system, and, as such, becomes a vital integrated part of the railroad's signal system. Therefore, the waiver request which NS seeks must meet the requirements of *Title 49 CFR Part 236 Subpart H—Standards for Processor-Based Signal and Train Control Systems*. NS has yet to file its Railroad Safety Program Plan, as required by §236.905, or the Product Safety Plan, as required in §236.907. Because NS has failed to fulfill the regulatory mandates required in Subpart H, FRA must reject this waiver request in its entirety.

NS proposes to use the automated tester to make the following FRA-required tests:

- 49 CFR §236.378—Time Locking;
- 49 CFR §236.379—Route Locking;
- 49 CFR §236.380—Indication Locking;
- 49 CFR §236.201—Track circuit control of signals;
- 49 CFR §236.202—Signal governing movements over hand-operated switch;
- 49 CFR §236.204—Track signaled for movements in both directions, requirements;
- 49 CFR §236.402—Signals controlled by track circuits and control operator;
- 49 CFR §236.403—Signals at control point;
- 49 CFR §236.404—Signal at adjacent control points;
- 49 CFR §236.405—Track signaled for movements in both directions, change of direction of traffic; and
- 49 CFR §236.107—Ground Tests.

If FRA chooses not to enforce the mandatory regulatory requirements contained in Subpart H, the use of such devices should be very narrow in scope, conditional, and supplemented with regular manual testing by qualified signalmen.

Today, before a signalman initiates a safety-critical test, he or she verifies the condition of the test equipment. If the signalman is using a volt-ohm meter, he or she tests a circuit with a known

value to prove that the meter is functioning properly and the test leads are not open. The same or similar equipment verification routine applies to the use of a megger, frequency meter, and a number of other test devices.

Any waiver should be conditioned on the pre-test field verification of the equipment, including the automated testing logic and connectivity to all devices and circuits to which the test equipment is interfaced. Additionally, the various states of all devices and circuits must be proven to be accurately reflected at the automated execution test device inputs and in the automated execution test device software. All pre-test verifications should be performed immediately prior to each use of the automated execution test device to perform FRA-required tests.

Because track circuits and track circuit sensitivity are fundamental to a safe and dependable signal system, when a change in status of a track circuit is part of the test, a manual shunt wire, operated by a qualified employee, should be the only method used to complete the test. Under no circumstances should the automated execution test device be connected to track circuits. We only need to look back to the Metro accident in Washington, D.C., which killed eight passengers and the train operator on June 22, 2009, to realize how vitally important properly adjusted track circuits are to rail safety. While the official cause has yet to be released by the National Transportation Safety Board, reports indicate that a track circuit “anomaly” likely caused the failure of the automated system to stop the moving subway train before it ran into a stopped subway train.

When shunting a track circuit is required for testing, all crossing warning systems within the limits of the test must be protected, as outlined 49 CFR §234.107, to avoid falsely activating a crossing warning system. Additionally, care must be taken to avoid causing a crossing warning system to fail to provide the minimum required warning when a train approaches. Motorists lose faith in warning systems that mistakenly warn of an approaching train when none is present. An even greater risk of an accident is present when a warning system fails to activate as a train approaches a grade crossing.

With respect to 49 CFR §236.378—*Time Locking*:

FRA should not permit automated §236.378 testing without some conditional requirements

that outline the calibration procedures on the onboard timer contained in the automated testing device. The function of this timer needs to be field verified immediately prior to each use of the automated execution test device when it is used to perform timer-related FRA-required tests.

With respect to *49 CFR §236.379—Route Locking*:

FRA should not permit §236.379 testing using an automated system. Because track circuits and track circuit sensitivity are fundamental to a safe signal system, when a change in status of a track circuit is part of the test, a manual shunt wire operated by a qualified employee should be the method used to complete the test.

With respect to *49 CFR §236.380—Indication Locking*:

FRA should not permit §236.380 testing using an automated system unless the test can be field verified with a qualified person immediately prior to each use of the automated execution test device to perform FRA-required tests.

With respect to *49 CFR §236.201—Track circuit control of signals, each track circuit*:

Under no circumstances should the automated tester be connected to track circuits. Because track circuits and track circuit sensitivity are fundamental to a safe and dependable signal system, when a change in status of a track circuit is part of the test, a manual shunt wire, operated by a qualified employee, should be the only method used to complete the test.

With respect to *49 CFR §236.202—Signal governing movements over hand-operated switch*:

All positions and corresponding indication circuits of each hand-operated switch should be field verified immediately prior to each use of the automated execution test device to perform FRA-required tests.

With respect to *49 CFR §236.204—Track signaled for movements in both directions, requirements*:

The function of indication circuits from opposing signals should be field verified immediately prior to each use of the automated execution test device to perform FRA-required tests.

With respect to *49 CFR §236.402—Signals controlled by track circuits and control operator*:

As previously stated, under no circumstances should the automated tester be connected to track circuits. In addition, the control, both to clear and stop, of each signal controlled by a control operator should be field verified from the control operator's control device to each signal immediately prior to the use of the automated execution test device to perform FRA-required tests.

With respect to *49 CFR §236.404—Signal at adjacent control points*:

NS has failed to provide enough information in its waiver request to understand how a test box at one control point is going to control the signal aspect at an adjacent control point. In the event that it can, in fact, control an opposing signal aspect at another location, the function would need to be field verified immediately prior to each use of the automated execution test device to perform FRA-required tests. Changing the state of an input to the automated execution test device to simulate a change should not be considered the same as manipulating the opposing signal for the purposes of the FRA test.

With respect to *49 CFR §236.405—Track signaled for movements in both directions, change of direction of traffic*:

NS has failed to provide enough information in its waiver request to understand how a test box at one control point is going to change the direction of traffic at an adjacent control point. In the event that it can, in fact, control an adjacent location, the function would need to be field verified immediately prior to each use of the automated execution test device to perform FRA-required tests. Changing the state of an input to the automated execution test device to simulate a change should not be considered the same as manipulating the adjacent control point for the purposes of the FRA test.

With respect to *49 CFR §236.107—Ground Tests*:

NS is too vague on what measure or current value would constitute a ground failure. When a circuit ground is discovered on a normally ungrounded circuit, NS states that, in order to resume testing “the user must identify and eliminate the source of the ground. ?”. **[Emphasis added]** BRS is perplexed as to why NS chose to end this statement in their waiver request¹ to

¹ www.regulations.gov — Document ID: FRA-2009-0037-0001.1, page 9

FRA with a *period and a question mark*. Circuit paths to ground discovered on normally ungrounded circuits are not optional and should never be ignored. FRA should not grant a waiver to NS for ground testing as the current manual method of testing for grounds is superior to automated testing, and the time required to perform such tests is minimal.

NS proposes to use a Cyclic Redundancy Check (CRC) to verify that no changes have been made to the draw layout and the configuration database. While the CRC is a generally reliable method for verifying that logic in a solid-state logic chip has not changed, it is not foolproof, and it does not prove that the layout and database are accurate and complete. CRC checking cannot be safely relied upon to fully verify that the logic is correct and the test is comprehensive.

Under NS's waiver request, if there is an error in the logic or omission of a critical test when the automated testing device is installed and the reference CRC is generated, then the problem will never be discovered because the logic will never be reviewed again if the CRC matches. In rare instances, errors in signal design, device omissions, and wiring errors are uncovered during regular testing after the initial cutover tests have been completed. Because of the redundancy of the regularly scheduled tests, any previously overlooked safety-critical errors are likely to be discovered. NS would have us believe that a CRC comparison is equally as comprehensive and requires no further review. Using the CRC alone to confirm that no errors exist in the draw layout and the configuration database and then conclude that the system will perform a comprehensive, omission-free test would be a serious error in judgment.

Should FRA decide to grant NS a waiver to install an automated tester, as a waiver condition, FRA should require that the automated tester and all related equipment be subjected to a full breakdown test annually. The annual breakdown test should include the wiring to the external circuits and the logic, including hardware and software functionality. Additionally, once every two years, manual testing of the interlockings should be performed in parallel with the automated test equipment to verify that the automated test equipment is functioning as designed, and that all the field equipment and field logic is being comprehensively tested. The automated test equipment configuration at the time of setup, annual, and biennial testing should be performed by personnel having in-depth knowledge of signal system design. While this redundant testing may seem overreaching, it is the only way to prove that automated testing is

performing without missing any elements and can only provide a margin of safety that is superior to any single method.

If FRA chooses to conditionally approve the waiver, such approval should be limited in scope to only one or two locations, which are isolated from densely populated areas and have a low volume of rail traffic, until such time that FRA can properly evaluate the equipment performance. During that time, all FRA-required tests should be done manually in parallel with the automated tester. The original logs of these tests and a summary of any differences between the manual tests and the automated tests should be provided to FRA for future reference and for future system reevaluation.

Regarding NS's waiver request to provide for electronic recordkeeping, *49 CFR §236.110—Results of tests* — in general, BRS is in favor of electronic recordkeeping. However, NS seeks to have FRA bless its methodology without restriction. If FRA intends on approving the NS waiver, FRA should require that the waiver conditions mirror the electronic recordkeeping conditions found in 49 CFR §228.19(g) and §228.201, as found in the recently published *May 27, 2009 Federal Register — Hours of Service of Railroad Employees; Amended Recordkeeping and Reporting Regulations; Final Rule*. In addition, test results should not be deleted or otherwise edited. Users should be able to add notes or amendments to a test record to document repairs or other test anomalies, but these additions should not alter or delete any information found in the record as recorded by the automated test equipment.

Users of the system should be required to make a visual inspection and general walk around inspection of the area and equipment to be tested prior to the FRA test being completed. While this general idea is not documented in FRA regulation, when these regulations were written, no one envisioned the capability of being able to perform these complicated, safety-critical tests at the push of a button or from a remote location. The regular visual inspection of these safety-critical components is necessary to ensure that signal system safety is not compromised by any number of varying conditions.

Under no circumstances should FRA allow or otherwise approve remote testing to fulfill FRA-required tests. The visual, auditory, and olfactory observations that are inherent to manual

inspections, but conspicuously missing in automated testing, are critical elements to maintaining a safe and problem-free signal system.

New and next-generation systems that perform safety-critical, processor-based functions, such as the safety-critical FRA-required testing, must comply with Subpart H. It is crucial that FRA enforce the intent of the language in 49 CFR §236, Subpart H, to protect workers and the public from unnecessary risk. Since the proposed automated testing system is wired directly into an existing signal system, it becomes an integral part of the signal system. As such, the regulations found in Subpart H apply and must not be ignored.

BRS is fundamentally opposed to this waiver because NS has not fulfilled the requirements found in 49 CFR part §236, Subpart H. For this reason alone, FRA must reject Norfolk Southern's waiver request in its entirety. BRS believes that allowing NS to install an automated testing device to replace testing by qualified employees is a leap of faith that will jeopardize the safety of the railroad, railroad employees, and the public. If FRA chooses to disregard the obvious hazards and the mandatory directives found in Subpart H, the conditions and limitations as outlined in this letter above would be in order.

Respectfully submitted,

A handwritten signature in black ink that reads "W. Dan Pickett". The signature is written in a cursive, flowing style.

W. Dan Pickett
International President

cc: Grady C. Cothen, Jr., Deputy Associate Administrator for Safety Standards and Program Development — FRA